

REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-3 and 5-37 are presently pending in this application, Claim 4 having been canceled, Claims 1, 10, 12, 13, 29 and 34-36 having been amended and Claim 37 having been newly added by the present amendment.

In the outstanding Office Action, Claims 13 and 34 were objected to for informalities; Claims 1-7, 9-13, 19, 21, 28, 29, 32, 35 and 36 were rejected under 35 U.S.C. §102(b) as being anticipated by Gipson et al. (U.S. Patent 4,732,446); Claim 34 was rejected under 35 U.S.C. §102(b) as being anticipated by Weidel (U.S. Patent 4,966,430); Claims 14-18, 20 and 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gipson et al.; Claims 8 and 23-26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gipson et al. in further view of Kropp et al. (U.S. Patent 6,457,875); Claims 30-32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gipson et al. in further view of Kosemura (U.S. Patent 6,330,377); and Claim 33 was rejected under 35 U.S.C. §103(a) as being unpatentable over Gipson et al. in further view of Weidel. However, Claim 27 was indicated as allowable if rewritten in independent form.

First, Applicants acknowledge with appreciation the indication that Claim 27 includes allowable subject matter.

Claims 1, 10, 12, 13, 29 and 34-36 have been amended and new Claim 37 has been added herein. These claim amendments and the new claim are clearly supported by the specification, claims and drawings as originally filed, for example, by the specification, page 9, lines 5-26 and original Claim 27. Also, in response to the claim objections, Claims 13 and 34 have been amended to clarify the subject matter recited therein. Thus, no new matter is

believed to be added thereby. If, however, the Examiner disagrees with any of the above amendments and addition in the claims, the Examiner is invited to telephone the undersigned who will be happy to work in a joint effort to derive mutually satisfactory claim language.

Briefly recapitulating, Claim 1 as currently amended is directed to an optoelectronic circuit board including a board having top and bottom surfaces, an optical fiber contained in the board between the top and bottom surfaces, the fiber terminating in a fiber end facet on a side wall of a hole defined in one or both of the surfaces, an optical emitter or detector mounted on one of the surfaces and electrically connected to electrical conductors on the one of the surfaces, the optical emitter or detector being configured to emit or detect a light signal along an optical axis in the hole, and a reflector positioned in the hole and configured to redirect the light signal along the optical axis substantially radially about the optical axis towards the fiber end facet.

Gipson et al. is directed to an electrical circuit. However, Gipson et al. fails to teach “a reflector positioned in the hole and configured to redirect the light signal along the optical axis substantially radially about the optical axis towards the fiber end facet” as recited in amended Claim 1. More specifically, Gipson et al. shows in Figure 1 a printed circuit board 10 having a hole 14 for receiving a chip carrier 12 and optic fibers 16. A photo transmitter die 46 and a photo transistor die 44 are positioned within the chip carrier 12 in addition to a beam splitter 32 which deflects a portion of the light transmitted data signals entering the chip carrier 12. However, the light entering from one side of the hole 14 either goes straight through the beam splitter 32 toward the optical fiber positioned at the opposing side of the hole 14, as clearly illustrated in Fig. 2, or as in Figs. 1, 4 and 15, the light is deflected by the beam splitter 32 upwardly or downwardly, namely only vertically, not substantially radially

about the optical axis of the light signal. Thus, Claim 1 is clearly distinguishable from Gipson et al.

Kropp et al., Kosemura and Weidel are concerned with an electro-optical arrangement, an optical transmitting/receiving apparatus, and a semiconductor circuit, respectively. However, none of Kropp et al., Kosemura and Weidel teaches “a reflector positioned in the hole and configured to redirect the light signal along the optical axis substantially radially about the optical axis towards the fiber end facet” as recited in amended Claim 1. Specifically, Kropp et al. simply shows in Figs. 1 and 2 an arrangement of electrooptic transducers 1, 2 and a coupling device 6 having lenses 4, 5, and Kosemura merely illustrates an optical device having a surface 10 provided with solder balls 60 to mount ball grid array on the mother board in the form of matrix as shown in Fig. 12C. Also, Weidel simply describes a circuit structure having deflection mirrors 8 and 8' disposed on a substrate 1 in an optical path between a transducer 7' and a light waveguide 5 as in Fig. 1. Claim 1 is therefore clearly distinguishable from Kropp et al., Kosemura and Weidel.

Because none of Gipson et al., Kropp et al., Kosemura and Weidel discloses the optoelectronic circuit board as recited in amended Claim 1, even the combined teachings of these cited references are not believed to render the structure recited in Claim 1 obvious.

Likewise, independent Claims 10 and 34 include subject matter substantially similar to what is recited in Claim 1 to the extent discussed above. Thus, Claims 10 and 34 are also distinguishable from Gipson et al., Kropp et al., Kosemura and Weidel.

Turning now to Claim 35, Claim 35 as currently amended is directed to a method of making an optoelectronic circuit board, and the method includes embedding an optical fiber between top and bottom surfaces of a board, and making a hole in the board so as to cut the optical fiber embedded in the board into segment each terminating in a fiber end facet on a

side wall of the hole. In other words, according to the method of Claim 35, an optical fiber is embedded between the top and bottom surfaces of a board, and a hole is made through the optical fiber so that a fiber end facet terminates on a side wall of the hole. As such, it is easier to make the fiber end facet substantially flush with the hole side surface.¹

The outstanding Office Action asserts that Gipson et al. describes a method of forming the optoelectronic circuit board 10 where optical fibers 16 are embedded within the board 10. However, Gipson et al. is not believed to teach “making a hole in said board so as to cut the optical fiber embedded in said board into segment each terminating in a fiber end facet on a side wall of said hole” as recited in amended Claim 35. On the other hand, Gipson et al. simply states that the hole 14 is formed in the printed circuit board 10 to receive the chip carrier 12, and that optic fibers 16 are embedded within the printed circuit board 10. Claim 35 is thus believed to be distinguishable from Gipson et al.

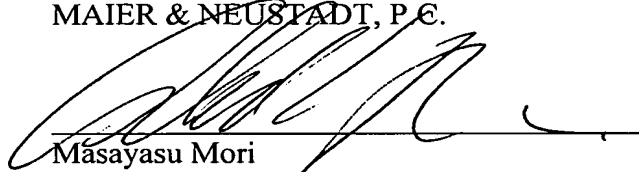
For the foregoing reasons, Claims 1, 10, 34, 35 and 37 are believed to be allowable. Furthermore, since Claims 2, 3, 5-9, 11-33 and 36 depend ultimately from one of Claims 1, 10, 34 and 35, substantially the same arguments set forth above also apply to these dependent claims. Hence, Claims 2, 3, 5-9, 11-33 and 36 are believed to be allowable as well.

¹ See specification, page 3, lines 15-21.

In light of the prior indication of allowable subject matter and in view of the amendments and discussions presented above, Applicants respectfully submit that the present application is in condition for allowance, and an early action favorable to that effect is earnestly solicited.

Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Masayasu Mori', is written over a horizontal line.

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